

Serial No. 10-648,922
Atty. Doc. No. 99P9028US01

REMARKS

No amendments have been made to currently pending Claims 21-40, and no new claims have been added or canceled by this Office Action response. Thus, Claims 21-40 remain and are presented for examination. Applicants respectfully request the Examiner to consider this continuation application and allow the pending claims.

Response to rejections under Sections 102 and 103:

Applicants claimed material system comprises a three-dimensional array of generally contacting ceramic geometric shapes (e.g. spheres A, B, C of Figure 2) that collectively has a length, width and thickness to form an overall substrate or coating (e.g. shroud seal 22 or thermal barrier layer 25 of Figure 1). Applicants claim that the ceramic geometric shapes within the array have a wall thickness of 50 to 500 micrometers and to pack the ceramic shapes to a density of 20-85%. Like Applicants material system, the Kamo finish coat comprises a three-dimensional array of ceramic geometric shapes (i.e. volcanic ash bubbles) that collectively has a length, width and thickness to form an overall coating. Unlike Applicants material system, the Kamo volcanic ash bubbles within the array have a wall thickness fairly in the range of 5-40 micrometers and are chemically densified.

The Examiner contends that "Kamo teaches the wall thickness [of the ceramic geometric shapes] when it states 'the finish coat is usually 0.005 in. (127 micrometers)'"'. Applicants respectfully believe that it is incorrect and illogical to conclude that since Kamo's finish coat array has a certain thickness, the volcanic ash bubbles that form the finish coat must have a wall thickness equal to the finish coat thickness. First, the Kamo specification clearly and explicitly

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discloses that the volcanic ash bubbles have a particle size of 10-90 microns, thus, the wall thickness of these bubbles must fairly be 5-40 microns. Col 3 line 37. Second, the Kamo finish coat does not even contain the volcanic ash bubbles. Col 3 lines 7-10; rather, the finish coat is added by applying the same base coat slurry (Step 1) col. 4 lines 59-67, and the base coat slurry comprises the same material system as the insulative coating (Step 2) except that the refractory oxide bubbles are eliminated col. 3 lines 7-10.

The Examiner next contends that "Applicants next state, without any evidence, that the [volcanic ash] bubbles have a wall thickness in the range of 5-40 micrometers". Applicants respectfully note that Kamo col. 3 line 37 provides evidence that the wall thickness of the bubbles is in the fair range of 5-40 micrometers.

The Examiner next contends that "because the coating of Kamo uses the same materials and is manufactured in substantially the same way, the claimed packing density would be inherent to the coating". As explained in detail in Applicants prior Office Action response, Kamo and Applicants coatings do not use the same materials and are not manufactured in substantially the same way. For example, unlike Applicants invention, Kamo discloses a material system formed from a slurry of refractory oxide particles (50-60% SiO₂, 15-30% ZrO₂ and 5-10% Cr₂O₃) and refractory volcanic ash bubbles (80% SiO₂ and 20% Al₂O₃). Col. 3 lines 25-40. Also unlike Applicants invention, the slurry is added to a solution of aqueous chromic acid. Col 3 lines 40-47 and a chromic-formic acid final densification is performed.

For the foregoing reasons, Applicants respectfully submit that there is no teaching or suggestion in Kamo of a wall thickness of 50-500 micrometers or to pack the ceramic shapes to a density of 20-85%. Reconsideration and withdrawal of the Section 102 and 103 rejections is respectfully requested.


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Conclusion

The commissioner is hereby authorized to charge any appropriate fees due in connection with this paper, including the fees specified in 37 C.F.R. §§ 1.16 (c), 1.17(a)(1) and 1.20(d), or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

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